Investigating underdocumented tone systems

(Dia)critical challenges in the study of tone

Tone patterns are challenging sound shapes

The problem with tonal transcription – reading them (small group work). Examples:

- ba^{231} 'rigid' in Matbat (Austronesian [South Halmahera West New Guinea], Indonesia)
- weeeṭ^{53} 'immigrants' in Shilluk (Nilo-Saharan [West Nilotic], South Sudan; plural of weeṭ^{5} 'immigrant')

The problem with tonal transcription – writing them. Shilluk example: a^{5}-kɔl

Reflections:
- Tonal transcription is not a detailed reflection of the melody
- Tonal transcription will not necessarily get the message across
- It is a hypothesis, analysis, not raw data
- Segmental transcriptions are closer to the raw data than tonal ones
- Considered against the background of argumentation for accountability, tonal transcriptions fall short
- And yet in many studies, transcriptions of tone are accepted as primary data
- Less accountable means less interesting / worthwhile, when it comes to fundamental research. And that is unfortunate because tone is an area of phonology of great complexity and diversity (cf. Hyman 2011).

Solution: include the sounds (cf. Rice 2014). In the paper, not as supplementary materials. Journals such as *Phonology* and *Language Documentation and Conservation* put in the effort to offer this. Illustration (Remijsen & Ayoker 2014).

What would happen if we as a community of practice would develop consensus to include sound examples in relation to challenging sound contrasts?

How to get a grip on tone patterns

Listening: we may be able to hear a difference in specification.

Mimicking: if we don't hear the difference, then mimicking can reveal it. We express a hypothesized categorization, and the native-speaker consultant evaluates. They are the authority who decides whether the investigation is on the right track. Requires a fully engaged native-speaker consultant.

Example – Low Rise vs. High Rise:

piiit^{14} 'demand.back:IMPERATIVE' vs. piiit^{34} 'catch.up.with:IMPERATIVE'

Mimicking: if we can mimick a pattern successfully, we have a grip (cf. Adank, Hagoort & Bekkering 2010).

Not through acoustic analysis: If the goal is to discover the hypothesized categories, acoustic analysis is not effective. Our auditory impressions are the best sorting tool to start out with.

Still, a tool like Praat can be very helpful, to narrow in on the hypothesized categories. Listening across speakers. And task of lumping forms together may be facilitated using an aid like the one described in Bird & Lee (2014).

Another method: analysis through resynthesis (eg PSOLA): manipulate the f0 trace from category A to category B. The native-speaker consultant evaluates whether it is an acceptable rendition of B.

In exploring a tone system, we need to use a rigorous experimental approach: manipulating the hypothesized tone feature while keeping all other factors constant. This methodology was first outlined in Pike (1948), and remains central to the study of tone (see e.g. Snider 2014, Yu 2014).

Strengthening the analysis of the surface-phonological patterns

At some point, we are ready to test, falsify and corroborate the hypotheses, through systematic collection of audio data and subsequent analysis, with the goal to corroborate as many of the categories as possible, collect evidence for contextual processes, and reveal what is not yet clear.

This exercise offers more opportunity for listening.

This is where acoustic analysis has an important role to play. It can help to articulate the phonetic characteristics of the melodic patterns, in terms of targets and timing relative to the segmental sequence.

In systematic data collection, we should of course continue with the experimental approach (e.g. Pike 1948, Snider 2014, Yu 2014). Finding optimal frames takes a while; it is time well spent.

Further phonological analysis

Beyond determining surface-phonological specifications, there is the whole journey of determining the phonological and morphological processes that underlie them. That is, tone systems show huge cross-linguistic diversity in terms of the degree and the nature of phonological complexity – e.g. intricate systems of tone sandhi; interaction with prosodic domains or intonation; etc. As Larry Hyman (2011) said: "tone can do everything that segmental and metrical phonology can do, but […] the reverse is not true."

Illustration from discussion of Chumburung in Snider (2014:717-719).

Chumburung citation forms:

k͡pà	'want'	k͡pá	'path'
ɲì	'know'	ɲí	'mother'

Chumburung nominalisations of verb stems:

kì-k͡pá 'wanting'

kí-ɲí 'knowing'

Note how the verbs surface with a High tone when they take the nominalization marker; other contexts support the hypothesis that they are Low-toned to begin with.

Here and elsewhere, the case to postulate abstract underlying representations is compelling.

This complexity means that, for many languages, the study of tone is often best seen as a longer-term project.

The challenge of dialect variation

It is also characteristic of tone that it is not just related languages that diverge with respect to such process, but also among mutually intelligible dialects. That is, tone is diachronically unstable, and diverges very easily.

In relation to the methodology, this means that it is important to restrict any investigation of a tone system to a single variety of the language. Concretely, it would make no sense to me to approach tone in Dinka, a language with over 2 million speakers, in relation to the language as a

whole. There is diversity in terms of inventory, sandhi processes, morphophonology, etc. See also studies on tone in Swedish, Japanese, Mixtec etc.

Exercise

Discovering tone categories and tone sandhi in the Bor dialect of Dinka.

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